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MARTIN, LAURA E				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,367

Applicant(s)

INUMA, TAIGA

Examiner

LAURA E. MARTIN

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8, 10-12, 14, 17, 18, 20, 22, 24, 26, 28 and 30-49 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 8, 10-12, 14, 17, 18, 20, 22, 24, 26, 28 and 30-49 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 10, 11, 14, 20, 22, 26, 28, 31-35, 38-41 and 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. (US 5462590 A) in view of Koitabashi et al. (US 2002/0044185 A1).

Yui et al discloses the following claim limitations:

As per claim 8: an ink jet ink composition comprising at least water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon

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group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claim 10: an ink-jet composition wherein the amine compound is selected from the group consisting of N,N-bis(hydroxyalkyl)glycine derivatives and N,N-bis(hydroxyalkyl)-2-aminoethanesulfonic acid derivatives (column 4, lines 33-47).

As per claim 11: a melting point of the amine compound being 50°C or more (column 4, lines 33-47 – listed amines have melting points over 180°C— taurin, N,N-bis-hydroxyethylaminoethane sulfonic acid).

As per claim 14: an ink jet recording method comprising forming an image by adhering an ink jet composition to a recording medium (column 1, lines 11-18), wherein the ink jet composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen,

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an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claim 20: an ink set comprising at least two inks (column 1, lines 11-18) comprising at least water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claim 22: an ink jet recording method comprising forming an image by using an ink set containing at least two ink (column 1, lines 11-18) by adhering an ink to a recording medium, wherein the ink comprises at least water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):

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wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claims 26 and 28: an ink comprising water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group

selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claims 32, 34, 38, 40, 44, and 46: the melting point of the amine compound is 100°C or more (column 4, lines 33-47 – listed amines have melting points over 100°C – taurin, N,N-bis-hydroxyethylaminoethane sulfonic acid).

As per claims 33, 35, 39, 41, 45, and 47: the melting point of the amine compound is 180°C or more (column 4, lines 33-47 – listed amines have melting points over 180°C– taurin, N,N-bis-hydroxyethylaminoethane sulfonic acid).

Yui et al. does not disclose the following claim limitations:

As per claims 8, 14, 20, and 22: the content of the amine compound is in a range of 13-30% by mass or the colorant is a self-dispersing pigment.

As per claim 31: a content of the amine is in a range of 15-30% or the colorant is a self-dispersing pigment.

As per claims 26 and 28: an amine compound in the range of 13 to 30%, the colorant is a self-dispersing pigment, or a colorless ink jet treatment liquid used together with an ink jet composition.

Koitabashi et al. disclose the following claim limitations:

As per claims 8, 14, 20, and 22: the content of the amine compound is in a range of 13-30% by mass [0090] and the colorant is a self-dispersing pigment [0013].

As per claim 31: a content of the amine is in a range of 15-30% [0090] and the colorant is a self-dispersing pigment [0013].

As per claims 26 and 28: an amine compound in the range of 13 to 30% [0090], the colorant is a self-dispersing pigment [0013], or a colorless ink jet treatment liquid used together with an ink jet composition [0114].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ink, method, and apparatus taught by Yui et al. with the disclosure of Koitabashi et al. in order to realize high quality images. It is also well known in the art to use different amines and different types of colorants in an ink, as well as different amounts of amines, as shown by Koitabashi et al, therefore, it would have been obvious to use a plurality of amines in different quantities.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. (US 5462590 A) and Koitabashi et al. (US 2002/0044185 A1), and further in view of Oki et al. (US 2002/0050226 A1).

Yui et al. as modified teaches an ink jet ink composition; however, it does not disclose a surface tension of the ink composition is 40 mN/m or less.

Oki et al. teaches a surface tension of the ink composition is 40 mN/m or less [0021].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ink jet ink composition of Yui et al. as modified with the disclosure of Oki et al. in order to create a higher quality and more consistent ink.

Claims 17, 18, 24, 30, 36, 37, 42, 43, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui et al. (US 5462590 A) in view of Koitabashi et al. (US 2002/0044185 A1) and Koitabashi (US 6471348 B1).

Yui et al. discloses the following claim limitations:

As per claim 17: an ink jet recording apparatus comprising at least a recording head including a liquid ejection surface having a nozzle for ejecting a liquid wherein during printing an image is formed onto a surface of the recording medium from the liquid ejection surface (column 1, lines 11-18 and column 1, line 59-column 2, line 1), an ink composition comprising at least water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claim 24: an ink jet recording apparatus comprising at least a recording head including a liquid ejection surface having two nozzles for ejecting a liquid wherein during printing an image is formed onto a surface of the recording medium from the liquid ejection surface (column 1, lines 11-18 and column 1, line 59-column 2, line 1), an ink composition comprising at least two inks, which each comprise water (column 2, lines 2-12), a colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claim 30: an ink jet recording apparatus comprising at least a recording head including a liquid ejection surface comprising at least two nozzles for independently ejecting at least two liquids to form an image on the recording medium (column 1, lines 11-18) and an ink set comprising water (column 2, lines 2-12), a

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colorant and a water-soluble organic solvent (column 2, lines 31-32), wherein the ink jet ink composition comprises at least one amine compound represented by the following formula (2):



wherein the amine compound represented by the formula (2) is any one of primary to tertiary amine compounds; at least one of three substituents represented by R.sub.1', R.sub.2' and R.sub.3' in the formula (2) comprises a hydrocarbon group having a hydroxyl group; and at least one of the three substituents comprises a hydrocarbon group containing an alkyl group having at its terminal either one of --CO.sub.2M and --SO.sub.3M in which M represents an atom or an atomic group selected from hydrogen, an alkali metal, an alkaline earth metal, an ammonium group and an organic amine group (column 2, lines 20-28).

As per claims 36, 42, and 48: the melting point of the amine compound is 100°C or more (column 4, lines 33-47 – listed amines have melting points over 100°C – taurin, N,N-bis-hydroxyethylaminoethane sulfonic acid).

As per claims 37, 43 and 49: the melting point of the amine compound is 180°C or more (column 4, lines 33-47 – listed amines have melting points over 180°C– taurin, N,N-bis-hydroxyethylaminoethane sulfonic acid).

Yui et al. do not disclose the following claim limitations:

As per claim 17: a content of the amine is in a range of 13 to 30%, the colorant is a self-dispersing pigment, or a recording medium transfer section for transferring a

recording medium in one direction while the recording medium faces the liquid ejection surface and a shortest distance between the recording medium and the liquid ejection surface is constantly maintained, the recording head moving in a direction perpendicular to the transfer direction of the recording medium.

As per claim 24: a content of the amine is in a range of 13 to 30%, the colorant is a self-dispersing pigment, or a recording medium transfer section for transferring a recording medium in one direction while the recording medium faces the liquid ejection surface and a shortest distance between the recording medium and the liquid ejection surface is constantly maintained, the recording head moving in a direction perpendicular to the transfer direction of the recording medium.

As per claim 30: a content of the amine compound is in a range of 13 to 30%, the colorant is a self-dispersing pigment, and a recording medium transfer section transferring a recording medium in one direction while the recording medium faces the liquid ejection surface and a shortest distance between the recording medium and ejection surface is constantly maintained for printing images while moving the recording head in a direction perpendicular to the transfer direction of the recording medium and a colorless ink jet treatment liquid comprising at least water and a water soluble organic solvent.

Koitabashi et al. disclose the following claim limitations:

As per claims 17 and 24: the content of the amine compound is in a range of 13-30% by mass [0090] and the colorant is a self-dispersing pigment [0013].

As per claim 30: the content of the amine compound is in a range of 13-30% by mass [0090], the colorant is a self-dispersing pigment [0013] and a treatment liquid comprising at least water and a water soluble organic solvent [0114].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ink, method, and apparatus taught by Yui et al. with the disclosure of Koitabashi et al. in order to realize high quality images. It is also well known in the art to use different amines in an ink, as well as different amounts of amines, as shown by Koitabashi et al, therefore, it would have been obvious to use a plurality of amines in different quantities.

Koitabashi (348) discloses the following claim limitations:

As per claim 17: a recording medium transfer section for transferring a recording medium in one direction while the recording medium faces the liquid ejection surface and a shortest distance between the recording medium and the liquid ejection surface is constantly maintained, the recording head moving in a direction perpendicular to the transfer direction of the recording medium (column 11, lines 10-32).

As per claim 24: a recording medium transfer section for transferring a recording medium in one direction while the recording medium faces the liquid ejection surface and a shortest distance between the recording medium and the liquid ejection surface is constantly maintained, the recording head moving in a direction perpendicular to the transfer direction of the recording medium (column 11, lines 10-32).

As per claim 30: a recording medium transfer section transferring a recording medium (column 7, lines 1-22) in one direction while the recording medium faces the

liquid ejection surface and a shortest distance between the recording medium and ejection surface is constantly maintained (column 11, lines 10-32) for printing images while moving the recording head in a direction perpendicular to the transfer direction of the recording medium.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the ink jet recording apparatus of Yui et al. with the disclosure of Koitabashi (348) because it is well known in the art as a mechanism for efficient printing.

As per claim 18, Yui et al. as modified disclose an ink jet recording apparatus except for the shortest distance between the liquid ejection surface and the recording medium is in a range from 1.0 mm to 2.0 mm and a largest length of the liquid ejection surface in the recording medium transfer direction is 2.54 cm or more. It would have been obvious to one having ordinary skill in the art at the time the invention was made to maintain a range of values for the distance between the liquid ejection surface and recording medium and the recording medium transfer direction, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Arguments

Applicant's arguments with respect to claims 8, 10, 11, 12, 14, 17, 18, 20, 22, 24, 26, 28, and 30-49 have been considered but are moot in view of the new ground(s) of rejection.

It is noted that the argument that it is well known to use different amines in an ink, thus it would have been obvious to vary the amounts of amine taught by Yui et al. with the range taught in Koitabashi et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Martin whose telephone number is (571) 272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/L. E. M./
Examiner, Art Unit 2853

Laura E Martin

/Manish S. Shah/
Primary Examiner, Art Unit 2853